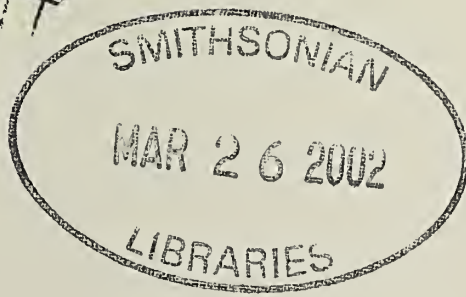


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La Société tire son origine de la "Nigerian Ornithologists' Society", fondée en 1964. Son but est de promouvoir l'intérêt scientifique pour les oiseaux de l'Ouest africain et de faire avancer l'ornithologie de ces régions principalement au moyen de sa revue *Malimbus* (anciennement *Bulletin of the Nigerian Ornithologists' Society*).

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Birds of Irangi Forest, Albertine Rift, Democratic Republic of Congo

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Summary

I document 116 bird species recorded in the Irangi area, Jan–Jun 1996, including 67 additions to the Irangi avifauna. The total number of bird species now known from Irangi is about 180. Most birds recorded are forest-dependent (forest specialists or generalists). The 40% coefficient of similarity between the birds of primary and secondary forests is caused mainly by primary forest birds entering clearings to feed, and by forest fragmentation. Of the 116 species recorded, 76 are also found in Budongo forest (Albertine Rift, NW Uganda). Conservation issues in the area are also discussed.

Résumé

Les oiseaux du Forêt d'Irangi, Rift Albertin, République Démocratique du Congo. Les 116 espèces d'oiseaux inventoriées à Irangi de janvier à juin 1996, dont 67 s'ajoutent à cette avifaune, sont ici annotées. Le nombre total d'espèces actuellement connues à Irangi est d'environ 180. La plupart dépendent de la forêt comme spécialistes ou généralistes. Le coefficient de similarité de 40% entre les espèces de forêt secondaire et primaire est dû au fait que les espèces de forêt primaire vont dans les clairières pour se nourrir, et de la fragmentation de la forêt. Des 116 espèces inventoriées, 76 se trouvent également dans la forêt de Budongo (Rift Albertin, NO de l'Ouganda). Je fournis enfin des données sur les moyens de conserver ces espèces.

Introduction

Irangi Forest is close to Kahuzi-Biega National Park, eastern Democratic Republic of Congo (DRC), and belongs to the Albertine Rift Sub-Region (Fig.1). The sub-region

is an endemic bird area and important for many other endemic taxa (Collar & Stuart 1988, Bibby *et al.* 1992). The high diversity of species and habitats is due to the biogeographic position of the Albertine Rift, a transition zone between the Guineo-congolian, the Lake Victoria mosaic and the Zambezian region (White 1983). Two important factors seem to have played a significant role in the distribution and composition of biodiversity in this sub-region: natural events (including the dry Pleistocene period, eruptions and altitude barriers) and high human population density (Hamilton 1976, Diamond & Hamilton 1980, Harcourt & Fossey 1981). The status of birds along the Albertine Rift is not well known (Dowsett 1985, Prigogine 1985, Collar & Stuart 1988) and the patterns of distribution have not been related to the environmental factors mentioned above. Although species lists are available for most of the Albertine forests, these are not complete (Britton 1980), partly due to identification problems (Dranzoa 1997).

Most work on Irangi birds has comprised only surveys in the forests and savanna (Wilson & Catsis 1990, Kizungu 1996, Kizungu & Beyers 1994, Kizungu *et al.* 1998) rather than ecological study. This paper attempts to determine the habitats used by the bird species found in the Irangi area and discusses their conservation.

Study Area

Irangi station (alt. 700–1200 m, 1°59'S, 28°27'E) is situated 110 km NNE from Bukavu on the Bukavu-Walikale-Kisangani road, between Bunyakiri and Hombo. It has a high rainfall all year, with a minimum in Jan–Feb; the mean temperature is *c.* 25°C. It is essentially an equatorial rainforest. The Irangi area is characterized by the presence of fog each morning until about 8h00, which affects bird activities.

The primary forest at Irangi is characterized by the canopy trees *Gilbertiodendron dewevrei*, *Julbernardia sereti*, *Cynometra alexandri* and *Piptadeniastrum africanum*, with *Puelia ciliata* and *Aframomum* spp. dominant in the herb layer and the shrub stratum characterized by *Sapium ellipticum*, *Scaphopetalum thonneri* and *Thomandersia laurifolia* (Kizungu & Beyers 1994). The secondary forest is dominated by the trees *Uapaca guineensis* and *Musanga cecropioides*, by the shrubs and lianas *Macaranga spinosa*, *Albizia gummifera*, *Harungana madagascariensis*, *Alchornea cordifolia* and *A. floribunda*, with understory plants including *Costus afer*, *Sporobolus* sp., *Panicum* sp. and *Setaria* sp.. Within the secondary forest are primary forest patches comprising tree species which characterize primary forest relicts, such as *Antiaris welwitschii*, *Canarium schweinfurthii*, *Celtis dubia* and *Gilbertiodendron dewevrei*. In the open areas are fish-rearing ponds, which attract some additional bird species.

The Irangi area exhibits forest fragmentation. The people living near the forest collect lianas and wood for house construction, and hunt game. Among the rich biodiversity of the forest other than the birds, are many plants of the Guineo-

congolian Region (e.g. *Gilbertiodendron dewevrei*, *Musanga cecropioides*, *Macaranga spinosa*) and others endemic to the eastern DRC (e.g. *Polyscias kivuensis*). Important animal species found within the area include primates characteristic of lowlands (e.g. *Cercopithecus ascanius*) and the otter shrew *Potamogale velox*.

Methods

The study was carried out in the Reserve Forest of the Centre de Recherche en Sciences Naturelles (CRSN-Lwiro) in Irangi. All observations were in lowland habitats, between 700 and 950 m altitude (cf. Prigogine 1975). North-south transects, of 3 km in primary forests and 5 km in secondary forest, were walked on ten days per month in the six months Jan-June 1996. Transect times were between 6h00 and 12h00 in primary and from 14h00 in secondary on the first day, and then in reverse order on the second day. I recorded all birds seen or heard in four habitat types: primary forest, secondary forest, fishponds, air. Birds were identified using Mackworth-Praed & Grant (1973), Williams & Arlott (1989), Lippens & Wille (1976), Sinclair *et al.* (1993) and Perlo (1995).

Results

The 116 species recorded in Irangi are presented below. Of these, 69 species occurred in secondary forest (SF: 58%), 49 in primary forest (PF: 42%), 12 in the fishponds (P: 10%), and 10 in the air (A: 8%). Species known or suspected to be forest-dependent in the region (Matthews 1996) are indicated by the following abbreviations in parentheses: (FG) forest generalists; (FS) forest specialists; (FGL) lowland forest generalists; (FSL) lowland forest specialists. Palaearctic migrants are indicated by PM. Numbers in parentheses indicate the months when observations were made. Abundance is indicated by: c (common: at least one individual recorded in 5-6 months); f (frequent: at least one individual recorded in 3-4 months); u (uncommon: at least one individual recorded in 1-2 months). * indicates not recorded by Wilson & Catsis (1990), Kizungu & Beyers (1994) or Kizungu (1996). B indicates species recorded in Budongo Forest by Matthews (1996).

Podicipedidae

Tachybaptus ruficollis Little Grebe. P(1-4)f* B.

Phalacrocoracidae

Phalacrocorax africanus Long-tailed Shag. P(1,3-5)f B.

Ardeidae

Bubulcus ibis Cattle Egret. A(1-4)f* B.

Egretta garzetta Little Egret. A(1–2)u*.

E. intermedia Yellow-billed Egret. A(1)u*.

Ardea purpurea Purple Heron. A(3–4)u*.

Threskiornithidae

Bostrychia rara Spot-breasted Ibis. P(1)u*.

Anatidae

Pteronetta hartlaubii Hartlaub's Duck. P(1–4)f.

Accipitridae

Pernis apivorus Honey Buzzard. SF(1,4–5)f* B.

Gypohierax angolensis Palm-nut Vulture. SF(1,3–4)f B.

Polyboroides radiatus Harrier Hawk. SF(4)u* B.

Accipiter tachiro African Goshawk. SF(2)u*.

Kaupifalco monogrammicus Lizard Buzzard. SF(1)u* B.

Buteo vulpinus Common Buzzard. PM, SF (1,4–5)f*.

Lophaetus occipitalis Long-crested Hawk-Eagle. SF(1,4–5)f*B.

Falconidae

Falco cuvierii African Hobby. (FG) PF(4)u* B.

Scolopacidae

Tringa ochropus Green Sandpiper. PM, P(1,4)u* B.

Actitis hypoleucos Common Sandpiper. PM, P(1,4)u.

Columbidae

Columba unicincta Grey Wood-Pigeon. (FS) SF(4)u* B.

C. iriditorques Western Bronze-naped Pigeon. (FG) PF, SF (3–5)f.

Turtur afer Red-billed Wood-Dove. SF(1,3–4)f* B.

T. tympanistria Tambourine Dove. (FG) SF(3)u* B.

Treron australis Green Fruit-Pigeon. (FG) PF, SF (3–4,6)f B.

Psittacidae

Psittacus erithacus Grey Parrot. (FS) SF(1–6)c B.

Musophagidae

Corythaeola cristata Great Blue Turaco. (FG) SF(1–3,5–6)f B.

Cuculidae

Clamator levaillantii Levaillant's Cuckoo. PM, PF(4)u* B.

Cuculus clamosus Black Cuckoo. (FS) PF, SF(3)u* B.

Chrysococcyx cupreus Emerald Cuckoo. (FG) SF, PF (1–6)c B.

C. flavigularis Yellow-Throated Green Cuckoo. (FG) PF(6)u*.

C. klaas Klaas's Cuckoo. SF(1–3)f*.

Ceuthmochares aureus Yellowbill. (FG) PF(3)u*.

Centropus monachus Blue-headed Coucal. SF(1–6)c B.

Apodidae

Rhaphidura sabini Sabine's Spinetail. (FS) PF(5)* B.

Neafrapus cassini Cassin's Spinetail. (FSL) A(2–4)f B.

Cypsiurus parvus Palm Swift. SF(2)u* B.

Apus apus Eurasian Swift. PM, A(1)u B.

A. barbatus African Black Swift. A(1)u.

A. horus Horus Swift. A(1)u*.

Alcedinidae

Alcedo quadribrachys Shining Blue Kingfisher. (FG) P(4)u* B.

Ceyx pictus Pygmy Kingfisher. P(4,6)u* B.

Halcyon badia Chocolate-backed Kingfisher. (FSL) PF(3,5)u* B.

H. malimbica Blue-breasted Kingfisher. (FG) PF(4)u* B.

H. senegalensis Woodland Kingfisher. P(1–4,6)c* B.

Coraciidae

Eurystomus gularis Blue-throated Roller. (FG) PF(5)u* B.

Bucerotidae

Tropicranus albocristatus White-crested Hornbill. (FG) PF(3,5)u.

Tockus camurus Red-billed Dwarf Hornbill. (FG) PF(1)u.

T. fasciatus Pied Hornbill. (FG) SF(1–6)c B.

Bycanistes fistulator Piping Hornbill. (FG) PF,SF (2–3,5)u B.

B. cylindricus White-thighed Hornbill. (FG) PF,SF (1–3,6)f B.

Ceratogymna atrata Black-casqued Wattled Hornbill. (FS) PF(1–6)c.

Lybiidae

Pogoniulus scolopaceus Speckled Tinkerbird. (FS) PF,SF (1–6)c B.

P. subsulphureus Yellow-throated Tinkerbird. (FS) PF,SF (1–6)c B.

P. atroflavus Red-rumped Tinkerbird. (FS) SF(1,4–5)f*.

Tricholaema hirsuta Hairy-breasted Barbet. (FS) PF,SF (1–3,6)f.

Indicatoridae

Indicator maculatus Spotted Honeyguide. (FS) PF(3)u*.

Picidae

Campethera caillauti Green-backed Woodpecker. (FG) SF(3)u.

C. caroli Brown-eared Woodpecker. (FG) PF(5)u B.

Hirundinidae

Psaldiprocne nitens Square-Tailed Roughwing. PF(3,5–6)f.

Pseudhirundo griseopyga Grey-rumped Swallow. PF,SF (5)u.

Hirundo nigrita White-throated Blue Swallow. A(1)u.

Motacillidae

Motacilla capensis Cape Wagtail. P(1–4)f.

M. clara Mountain Wagtail. P(1,3)u.

M. aguimp African Pied Wagtail. P(1–4,6)c.

Pycnonotidae

Andropadus virens Little Greenbul. (FG) PF,SF(4)u B.

A. latirostris Yellow-whiskered Bulbul. (FG) PF,SF (2,4)u B.

Ixonotus guttatus Spotted Bulbul. (FS) SF(4–5)u* B.

Chlorocichla flavicollis Yellow-throated Bulbul. SF(2)u B.

Criniger calurus Red-tailed Bulbul. (FS) PF(1–2)u* B.

Pycnonotus barbatus Common Bulbul. SF(1–6)c B.

Turdidae

Stizorhina fraseri Fraser's Ant-Thrush. (FS) PF(2–4,6)f* B.

Sylviidae

Eremomela badiceps Brown-crowned Eremomela. (FGL) SF(3–4,6)f B.

Sylvietta virens Green Crombec. (FG) SF(4)u B.

S. denti Lemon-bellied Crombec. (FSL) SF(1)u* B.

Hylia prasina Green Hylia. (FG) PF,SF (2,5–6)f.

Prinia subflava West African Prinia. SF(4–6)f* B.

Apalis nigriceps Black-capped Apalis. (FSL) SF(5)u*B.

A. rufogularis Buff-throated Apalis. (FS) PF,SF (2–4)f B.

Camaroptera brachyura Grey-backed Camaroptera. PF,SF (1–4,6)c B.

Muscicapidae

Fraseria ocreata Forest Flycatcher. (FG) PF,SF(3)u B.

Muscicapa cassini Cassin's Grey Flycatcher. (FG) SF(1–5)c B.

M. sethsmithi Yellow-footed Flycatcher. (FS) PF(2–3,5)f* B.

M. infuscata Sooty Flycatcher. (FG) SF(4)u*.

Platysteiridae

Dyaphorophya castanea Chestnut Wattle-eye. (FS) PF,SF(1)u B.

Monarchidae

Erythrocerus mcallii Chestnut-capped Flycatcher. (FS) PF(2–3)u* B.

Terpsiphone viridis African Paradise Flycatcher. PF,SF(3)u B.

T. bedfordi Bedford's Paradise Flycatcher. (FS) PF(2–3,5)f.

Nectariniidae

Anthreptes rectirostris Green Sunbird. (FS) SF(4)u* B.

A. collaris Collared Sunbird. (FG) SF(1,3,5)f B.

Nectarinia seimundi Little Olive Sunbird. (FGL) PF(3)u B.

N. olivacea Olive Sunbird. (FS) PF,SF (2,4)u B.

N. verticalis Green-headed Sunbird. (FG) SF(2,3)u* B.

N. cyanolaema Blue-throated Sunbird. (FS) SF(5)u* B.

N. senegalensis Scarlet-chested Sunbird. (FG) SF(5)u* B.

N. chloropygia Olive-bellied Sunbird. (FG) SF(1–4)f B.

N. superba Superb Sunbird. (FGL) SF(1,3–4)f* B.

Oriolidae

Oriolus brachyrhynchus Black-headed Oriole. (FS) PF,SF (1,3–6)f B.

Malaconotidae

Dryoscopus senegalensis Pink-footed Puffback. (FG) SF(1)u*.

Nicator chloris Common Nicator. (FG) SF(1–2,4–6)f B.

Dicruridae

Dicrurus atripennis Shining Drongo. (FS) PF(1)u.

Corvidae

Corvus albus Pied Crow. SF(1,3–5)f.

Sturnidae

Onychognatus fulgidus Forest Chestnut-winged Starling. (FS) PF,SF (1,3–4,6)f B.

Lamprotornis purpureiceps Purple-headed Glossy Starling. (FG) PF,SF (1–4,6)c B.

Cinnyricinclus leucogaster Amethyst Starling. SF(3)u B.

Ploceidae

Ploceus tricolor Yellow-mantled Weaver. (FS) PF(3)u* B.

P. preussi Preuss's Golden-backed Weaver. PF(3)u*.

Malimbus malimbicus Crested Malimbe. (FG) PF(3)u B.

M. rubricollis Red-collared Malimbe. (FS) PF(6)u* B.

M. coronatus Red-crowned Malimbe. (FG) PF(1)u*.

Estrildidae

Nigrita canicapilla Grey-crowned Negrofinch. (FG) SF(4–5)f B.

N. luteifrons Pale-fronted Negrofinch. SF(4)u.

N. bicolor Chestnut-breasted Negrofinch. (FSL) SF(1–2,4–5)f B.

N. fusconota White-breasted Negrofinch. (FG) SF(4–5)u* B.

Estrilda melpoda Orange-cheeked Waxbill. SF(1–6)c.

E. atricapilla Black-headed Waxbill. SF(4–6)f.

Lonchura bicolor Red-backed Mannikin. SF(1–2)u.

L. fringilloides Pied Mannikin. SF(3–4)u.

In primary forest, *Chrysococcyx cupreus* and *Pogoniulus subsulphureus* were the commonest species, and they were inventoried during all 6 months in both primary and secondary forests. Of the bird species found only in primary forest, *Ceratogymna atrata* was the most conspicuous. Among the 49 primary forest species, 46% were forest generalists, 32% forest specialists, 6% lowland forest specialists, and 2% lowland forest generalists. The remainder include widespread species and visitors from other habitats, including Palearctic migrants.

In secondary forest, *Pycnonotus barbatus* and *Pogoniulus subsulphureus* were the most common species, with records during all six months. Of the 69 secondary forest species, 37% were forest generalists, 19% forest specialists, 4% lowland forest specialists and 3% lowland forest generalists.

Among the 12 fishpond species, *Motacilla aguimp* and *Halcyon senegalensis* were the most common species. Only *H. senegalensis* was recorded during all six months.

In the air, *Apus horus* and *Bubulcus ibis* were the most common of the ten species recorded, which included one lowland forest generalist.

With 49 bird species inventoried only in primary forest, 69 in secondary forest and 24 in both primary and secondary forests, the Sorensen coefficient of similarity (Bachelier 1963) was 40%.

Discussion

Among the species inventoried, 67 had not been included by Wilson & Catsis (1990), Kizungu & Beyers (1994) or Kizungu (1996). Of the 116 species recorded in the Irangi area, 76 are also found in Budongo Forest.

In Irangi, some Palaearctic migrants, such as *Apus apus*, winter above the forest, while others concentrate along forest edges, clearings, in secondary forest and around villages and roads. They are thus somewhat favoured by the destruction of the primary forest which has probably allowed many of them to extend their winter range, for instance *Pernis apivorus*.

The African Peacock *Afropavo congensis*, previously reported by the local Tembo people (Kizungu *et al.* 1998), has been extinguished from Irangi forest due to severe damage and heavy hunting. However, *Alcedo quadribrachys* and *Muscicapa cassini* are still observed in Irangi (700–950 m), although they were thought extinguished from Nyungwe forest (Rwanda) by Dowsett-Lemaire (1990). *Estrilda atricapilla* and *Nigrita canicapilla* were observed at relatively low altitudes in Irangi (700–950 m), thus extending their formerly known altitudinal range (Dowsett-Lemaire 1990, Perlo 1995) down to 700 m.

Among the hornbills listed by Kemp (1979) as African lowland forest endemics, four (*Tockus fasciatus*, *Tropicranus albocristatus*, *Bycanistes fistulator*, *Ceratogymna atrata*) have been found in Irangi at 700–1000 m, while only one (*Bycanistes subcylindricus*: pers. obs.) has been found at Kahuzi-Biega (1300–3300 m).

The 40% coefficient of similarity between primary and secondary forest birds was caused mainly by forest birds entering clearings for feeding (Kizungu 1996). Further, because of the destruction of primary forest, some truly primary forest species, like *Ceratogymna atrata*, *Corythaeola cristata*, *Psittacus erithacus*, *Terpsiphone bedfordi* and *Tropicranus albocristatus*, have also been inventoried in the secondary forest.

Since most Irangi birds are forest specialists, generalist or visitors, action to conserve the forest is essential because the current intense and uncontrolled destruction may cause all these birds to disappear. Because of forest destruction, we lack recent information about the status of the rare species and we need more surveys to assess their situation in the study area. However, some of the following species are potentially threatened: the Congo endemic *Terpsiphone bedfordi*, the hornbills *Tockus fasciatus*, *Bycanistes fistulator*, *Tropicranus albocristatus* and *Ceratogymna atrata*, and all species that suffer from trade (*Psittacus erithacus*, *Corythaeola cristata*) or hunting (*Ceratogymna atrata*, *Bycanistes* spp., *Corythaeola cristata*). In many parts of Irangi, the large hornbills have completely disappeared, mainly due to hunting. Hunting laws usually ignore the breeding seasons of forest birds and are rarely (if ever) enforced. It will be difficult to stop or even reduce hunting because of reliance on bird hunting for food and income. The trade in wild caught birds is also important in Irangi.

As stated by Thiollay (1985), the most efficient way to protect all the concerned species is to set aside large areas of undisturbed habitat or to let them recover if they have been exploited. Where only exploited forest can be preserved, it will be better to set apart some tiny undisturbed patches (the least accessible), rather than promote selective exploitation throughout. In cultivated areas, the only way to maintain many forest species is to leave as many big trees as possible, scattered through the plantations, as well as woodlots and larger patches of forest between relatively small clearings.

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La population ouest-africaine du Flamant nain *Phoeniconaias minor*: effectifs, répartition et isolement

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Résumé

L'effectif de Flamants nains *Phoeniconaias minor* fluctue dans le delta du Sénégal entre une centaine et près de 50 000 individus. Des observations récentes sur le littoral guinéen mettent en évidence l'existence d'un second site de stationnement régulier en Afrique de l'Ouest, pouvant accueillir plus de 10 000 individus. La quasi-absence de reproduction en Afrique de l'Ouest ainsi que l'ampleur et la chronologie des fluctuations d'effectifs dans cette région permettent de conclure, contrairement à ce qui est habituellement présumé, que la population ouest-africaine bénéficie nécessairement d'échanges avec la population d'Afrique orientale et/ou celle d'Afrique australe.

Summary

Size, distribution and isolation of the W African population of Lesser Flamingo *Phoeniconaias minor*. The population of Lesser Flamingo in the Senegal Delta fluctuates between *c.* 100 and 50,000 individuals. Recent observations on the coast of Guinea have revealed a second regularly used W African site, holding up to 10,000 birds. The near-absence of reproduction in the W African population, and the amplitude and timing of the fluctuations there, indicate that, contrary to what has usually been assumed, the W African population experiences exchange with one or more of the E or southern African populations.

Introduction

Le Flamant nain *Phoeniconaias minor* est réparti essentiellement en Afrique, en trois populations séparées. La plus importante se trouve en Afrique orientale, dans la vallée du Rift. La population d'Afrique australe est centrée sur la Namibie et le Botswana. Ces deux populations étaient considérées comme isolées mais on suppose maintenant

l'existence d'échanges entre elles en raison de fluctuations d'effectifs concomitantes et de ce que ces oiseaux s'avèrent en fait capables de couvrir cette distance d'une seule traite (Simmons 2000). L'Afrique occidentale héberge une petite population localisée dans le delta du fleuve Sénégal et évaluée à environ 6000 individus (Hoyo *et al.* 1992). En raison de son éloignement avec des deux autres zones de peuplement africaines (plus de 5000 km), des capacités présumées de déplacement de ces oiseaux et de la rareté des observations de l'espèce sur des sites intermédiaires, l'éventualité d'échanges entre la population occidentale et l'une ou l'autre des deux autres populations africaines n'est évoquée que de façon hypothétique (Brown *et al.* 1982, Hoyo *et al.* 1992, Johnson 1997). L'intensification récente des recherches ornithologiques en Afrique de l'Ouest permet d'apporter des éléments de discussion sur ce point, ainsi que des précisions sur la taille et la répartition de la population ouest-africaine.

Résultats et discussion

La seule tentative de reproduction avérée (et infructueuse) de l'espèce en Afrique de l'Ouest, signalée par Naurois (1965), concerne l'Aftout es Saheli, situé dans la partie mauritanienne du delta du Sénégal, où près de 800 couples ont pondu en 1965. Une tentative de reproduction y a de nouveau eu lieu en 1988, sans succès selon Hamerlynck & Ould Messaoud (2000) bien qu'une centaine de jeunes volants, dont certains encore nourris par leurs parents, aient été observés en mars 1988 au Parc national des Oiseaux du Djoudj (ci-après "Djoudj"), ce qui témoignait de la réussite d'une reproduction régionale. En 1999, l'observation de quelques jeunes volants à c. 20 km de l'Aftout es Saheli laisse présumer également qu'une reproduction a pu avoir lieu (Hamerlynck & Ould Messaoud 2000).

Les effectifs de Flamants nains stationnant dans le delta du Sénégal sont maintenant correctement appréhendés, grâce à la succession de dénombrements réguliers d'oiseaux d'eau qui y sont effectués. Ils le sont habituellement en janvier, pour prendre au mieux en compte les oiseaux d'eau d'origine paléarctique.

Tableau 1. Effectifs de Flamants nains comptés dans le delta du Sénégal en janvier.

Année	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Effectif	1185	830	6156	105	3093	5125	8348	11658	7544	6810	1770	4022	1004

De janvier 1989 à 2001 inclus, l'effectif dénombré dans le delta a été en moyenne de 4435 individus. Il a en fait varié très fortement (Tableau 1), entre 105 en 1992 et 11658 en 1996 (Schricke *et al.* 1989, 1999, com. pers., Perennou 1991, Girard *et al.* 1991, 1992, Trollet *et al.* 1993, Taylor & Rose 1994, Dodman & Taylor 1995, 1996, Dodman *et al.* 1997, 1999, M. Benmergui com. pers.). En dehors des dénombrements

de janvier, ce dernier maximum a été largement dépassé puisqu'au Djoudj 45 000, 46 500 et 15 000 Flamants nains ont été dénombrés respectivement les 19 et 26 février et le 23 mars 1990 (Fouquet 1990, Rodwell *et al.* 1996). Le delta du Sénégal accueille donc un effectif de Flamants nains extrêmement fluctuant, pouvant approcher 50 000 individus. Ces différents résultats sont affectés d'incertitudes et d'approximations, tenant d'une part à ce que l'ensemble des zones humides du delta susceptibles d'accueillir des Flamants nains n'a pas toujours été couvert exhaustivement, et d'autre part aux difficultés particulières que présente l'estimation de la taille de groupes importants de Flamants nains.

Ailleurs en Afrique occidentale et centrale, le Flamant nain a été observé occasionnellement ou accidentellement en Casamance, en Gambie, en Guinée-Bissau, en Sierra Leone, au Libéria, au Niger, au Tchad, au Nigéria, au Cameroun et au Gabon (Viellard 1972, Louette 1981, Girardin & Christy 1982, Dugan 1984, Guillou & Pages 1987, Pérennou 1991, Dowsett & Dowsett-Lemaire 1993, Elgood *et. al.* 1994, Barlow & Wachter 1997, Gatter 1997). En Guinée, lors d'un survol aérien de la côte le 25 janvier 1988, Altenburg & van der Kamp (1991) ont vu un groupe d'au plus 10 000 Flamants, qui leur ont paru être tous des Flamants nains. Au même endroit, ils ont observé le 3 janvier 1990 un groupe d'au moins un millier de Flamants nains.

Nous y avons effectué des dénombrements d'oiseaux d'eau sur le site appelé Khonibenki (ce qui peut se traduire par "vasière aux oiseaux"). Il est constitué de vasières intertidales, situées à l'Est du marigot de Kaliki, autour de 10°27'N, 14°34'W. La surface maximale exploitable par les Flamants nains sur ce site a été mesurée sur une carte bathymétrique au 1:100 000 (Ministère de la Défense de l'U.R.S.S. 1980), corrigée en fonction de l'évolution géomorphologique intervenue depuis son édition. Elle est constituée en premier lieu par la surface des vasières situées à une altitude positive, qui est d'environ 4200 ha. Il s'y ajoute la surface dont l'altitude est comprise entre 0 et -0.45 m puisque le Flamant nain s'alimente habituellement dans une profondeur d'eau inférieure à 45 cm (Cramp 1977). Cette surface est de l'ordre de 1500 ha, portant le total à environ 5700 ha. Les sédiments y ont une granulométrie hétérogène et vont du sablo-vase à la vase très molle. Nous y avons effectué, à quatre reprises, des dénombrements à partir du sol, les 14 mars 1998, 15 janvier 1999, 15 janvier et 20 décembre 2000, dont le premier n'a couvert que partiellement ce site. Les effectifs dénombrés ont été respectivement 450, 1600, 1300 et 10 900 individus. Lors des quatre dénombrements, ont été observés respectivement 15, 100, 125 et 600 Flamants roses *Phoenicopiterus ruber*. Ce site accueille en outre divers oiseaux piscivores, environ 6000 laridés, et 25 000 limicoles d'une vingtaine d'espèces.

La présence du Flamant nain ayant été constatée à chacune de ces six dates, réparties sur une douzaine d'années, elle peut y être considérée comme régulière.

Les deux sites de stationnement régulier de l'espèce connus en Afrique de l'Ouest, le delta du Sénégal et les vasières de Khonibenki, ne sont distants que d'environ 700 km, et il est probable que des échanges interviennent, ce qui est

corroboré par les observations faites occasionnellement sur des sites intermédiaires. Ces échanges ne peuvent seuls expliquer les fluctuations locales d'effectifs constatées. Des dénombrements quasi-simultanés dans les deux secteurs en janvier 1999 et 2000 ont par exemple fourni des effectifs totaux de 3400 et 3200, très inférieurs à celui de l'hiver 2000–2001, ou à celui compté dans le seul delta du Sénégal en 1996, tous deux supérieurs à 11 000; au début de 1990, moins de 2000 individus ont été comptés au total sur les deux sites en janvier, alors que plus de 45 000 individus ont été comptés sur l'un des deux en février.

Même en tenant compte des incertitudes et approximations signalées précédemment, il apparaît que l'ampleur et la chronologie des fluctuations constatées sont incompatibles avec ce que pourrait être la dynamique d'une population locale autonome de Flamants nains. De plus, le maintien d'une telle population locale est, en soi, incompatible avec la quasi-absence de reproduction connue en Afrique de l'Ouest. Compte tenu de l'amélioration de la connaissance ornithologique de cette région, et des exigences écologiques de l'espèce, il est très improbable qu'un site significatif de reproduction y reste à découvrir. Les dizaines de milliers de Flamants nains que nous avons observés au Sénégal et en Guinée étaient d'ailleurs tous des adultes. Il y a donc nécessairement des échanges entre la population ouest-africaine de Flamants nains et l'une et/ou l'autre des deux autres populations africaines. Cette conclusion est corroborée par le fait qu'il en va probablement de même entre les populations d'Afrique de l'Est et d'Asie. En Asie, principalement en Inde, ont été dénombrés jusqu'à 150 000 Flamants nains (Pérennou *et al.* 1994). Ils sont probablement, pour l'essentiel, originaires d'Afrique de l'Est dans la mesure où la reproduction a été rarement constaté en Asie (Mundkur *et al.* 1989, Johnson & Durand 2001).

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A commentary on a list of birds collected on the 1841 naval expedition to the Niger River

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Summary

During the 1841–2 British Royal Naval Expedition to the River Niger, a bird collection was made in the area, including the islands of the Gulf of Guinea. Published and unpublished sources are used to establish the chronology of the expedition. These sources and a published list of the birds collected are used to locate and identify specimens of this historical collection.

Résumé

Commentaire sur une liste d'oiseaux collectés au cours de l'expédition navale de 1841 sur le fleuve Niger. Au cours de l'expédition de 1841–2 de la Marine Royale Britannique sur le fleuve Niger, une collection d'oiseaux fut effectuée dans la région, y compris les îles du golfe de Guinée. La chronologie de l'expédition fut établie à partir de documents publiés et inédits. Ces documents, ainsi qu'une liste publiée des oiseaux collectés, sont utilisés pour localiser et identifier les spécimens de cette collection historique.

Introduction

A popular account of the 1841 naval expedition to the Niger River (Allen & Thomson 1848) contains many references to the natural history and geology of West Africa and includes an appendix list of 45 bird species collected between June 1841 and July 1842, and one, *Vanellus albiceps*, collected on an earlier visit to the Niger in 1832 (Allen & Thomson 1848, vol. 2, pp. 488–508). The appendix is reproduced here with comments on the status of the species. An attempt has also been made to establish the history and present locations of the specimens mentioned below.

The three ships of the expedition, the *Albert*, the *Wilberforce* and the *Soudan* sailed from Devonport on 12 May 1841. Zoological and botanical collections were made as the expedition called at the Atlantic islands and the coast of West Africa before reaching the Niger Delta and entering the river at Akassa on Friday, 13 Aug

1841. The ships slowly ascended 422 km of the Niger and reached the confluence of the Niger and Benue rivers by 11 September (Allen 1841–2). However, by this time many of the members of the expedition had developed fever and some had died. The *Wilberforce* and *Soudan*, with the sick on board, withdrew from the Niger to the naval base at Clarence (now Malabo) on Fernando Po (now Bioko) on 21 September (Allen 1841–2). The *Albert* continued 112 km upstream to Eggan, but the increasing casualty rate and the falling river level, as the dry season advanced, made further progress impossible and exploration had to be abandoned. The *Albert* withdrew to Malabo on 5 October. The first party of survivors, including the commander of the expedition, Captain Dundas Trotter, returned to Britain from Bioko in November 1841. The remaining survivors sailed in the *Albert* and *Wilberforce* to Ascension in November and December (Allen 1841–2). These two ships returned to West Africa in March 1842 and the expedition was based on Bioko until July 1842. The present day territories of Madeira, Canary Islands, Ascension, Cape Verde Islands, Sierra Leone, Liberia, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko and Annobón) and São Tomé and Príncipe were visited and 534 km of the Niger were examined during the expedition.

The ornithological collections listed in the Natural History Appendix were made by the two authors, Captain William Allen and the surgeon Thomas Thomson, and by two of the five civilian scientists appointed to the expedition, Louis Fraser and William Stanger (Allen & Thomson 1848). Dates and places given in the text can be confirmed by Government papers relating to the expedition held in the Public Records Office at Kew (herein cited as PRO unpubl.) and the U.K. Hydrographic Office at Taunton (cited as UKHO unpubl.), by published accounts by other survivors (Schön & Crowther 1842, McWilliam 1843), by unpublished letters in the papers of the 13th Earl of Derby (1840–51), held in the Liverpool Record Office (cited as LRO Derby unpubl.) and in the Maritime Archives of the National Museums and Galleries on Merseyside (cited as MAL Derby unpubl.), and by unpublished material in the William Jardine papers held in the Royal Scottish Museum, Edinburgh (cited as RSM Jardine unpubl.).

Birds listed in the Natural History Appendix

The 46 species listed in the Natural History Appendix of Allen & Thomson (1848) include birds from eight political areas of West Africa (Table 1), and are only part of a larger bird collection made on the expedition. All but three species in the Natural History Appendix, *Cypselus parvus* [*Cypsiurus parvus*], *Zizorhis gigantea* [*Corythaeola c. cristata*] and *Corythaix macrorhyncha* [*Tauraco macrorhynchus verreauxi*], were described as new, and 38 of the 43 species are recognised as valid today, 37 by Urban *et al.* 1986, 1997, Fry *et al.* 1988, 2000, Keith *et al.* 1992 (hereafter summarised BoA) plus *Terpsiphone rufiventer tricolor* (see below). The

type localities of five taxa given by Allen & Thomson (1848) are erroneous: the type locality of *Drymoica* [*Cisticola*] *lateralis* is Liberia not Accra; that of *D. strangei* [*C. natalensis strangei*] is Accra not Cape Palmas; that of *Nectarinia chloropygia* [*Cinnyris chloropygius*] is Nigeria not Bioko; that of *Tchitrea* [*Terpsiphone*] *atrochalybeia* is São Tomé not Bioko; and that of *Muscipeta smithii* [*Terpsiphone rufiventer smithii*] given as Western Africa, is restricted to Annobón.

Table 1. Type-localities of birds listed in the natural history appendix of Allen & Thomson (1848). Localities have been corrected where necessary (see text).

Locality	Species collected	New types collected	New types recognised as valid taxa in BoA
Annobón	1	1	1
Bioko	22	21*	17*
Cameroon	1	0	0
Ghana	7	6	6
Liberia	3	3	3
Nigeria	8**	8**	8**
São Tomé	3	3	2
Sierra Leone	1	1	1
Total	46	43	38

*Includes *Terpsiphone rufiventer tricolor* (Fraser).

**Includes *Vanellus albiceps*, collected 1832.

Allen and Thomson presented birds from their collections to the British Museum in 1842 and 1843. Others were bought by the Museum: 64 skins from Fraser in 1847; two on the disposal of the Zoological Society's collection in 1855; seven at the sale of the Eyton Collection in 1881 (Sharpe 1906); and one from Gerrard, purchased at Simpson's sale of bird skins from the Jardine collection in 1886. Listed in the accession register of the museum between 1842 and 1886 are 114 birds known to have been collected on the expedition. Of the 46 species listed in Allen & Thomson's (1848) appendix, 42 are represented among these acquisitions, including 39 type specimens presently held at The Natural History Museum (BMNH), Tring. Type specimens of the other four were not acquired by the museum: *Strix poensis*, *Bucco subsulphureus*, *Pitta pulih* and *Nectarinia stangerii*. Unsuccessful searches for these were made in the collections held in the Academy of Natural Sciences at Philadelphia, the Cambridge University Museum of Zoology, the Muséum National d'Histoire Naturelle in Paris and the museums of Bolton, Liverpool, Manchester and Norwich (M. Germain, C.T. Fisher, P. Francis, M. Germain, A.G. Irwin, H. Mcghie, N.H. Rice, R.J. Symonds, pers. comms).

Other birds collected on the expedition but not included in Allen and Thomson's (1848) list were also acquired by BMNH; their details in the acquisitions register are brief, but include the country of collection of 16: eight of which were from Fraser's collection (*Passer iagoensis* from St Vincent; *Sterna* sp. and *Phaeton* sp. from Ascension; *Cuculus* sp. from Ghana; *Ethiops canicapillus* [*Nigrita canicapilla*], *Anthreptes fraseri*, [*Deleornis fraseri* holotype BMNH 1847.1.18.38] and *Vulture angolensis* BMNH 1847.1.18.62 from Bioko; *Psittacus timneh* [*P. erithacus timneh* holotype BMNH 1855.12.19.368] from Sierra Leone). The other eight were from Thomson's collection, four with the country probably correct (*Turdus* sp. and *Euplectus* sp. from Bioko; *Euplectus* sp. from Idda; *Cinnyris Eboensis* [*C. venusta* male] BMNH 1842.9.24.7 from Aboh in Nigeria) and the other four with the country of collection listed as Bioko but probably incorrectly (*Halcyon* [*H. malimbica dryas*, holotype BMNH 1847.11.4.6], *Muscipeta* sp., *Gallinula* sp. and *Sula* sp.).

The collectors and their collections

William Allen R.N., F.R.S., (1793–1864)

Allen commanded H.M.S. *Wilberforce* and took command of the expedition after Captain Trotter was invalided home in November 1841. He returned to Britain with the main party in July 1842. His collection held in BMNH includes three species listed in the Allen & Thomson (1848) appendix. He had made an earlier visit to the Niger when he joined the private Macgregor Laird expedition to the Niger of 1832–4 at the request of the Admiralty, to chart the river. During that expedition he had made a zoological collection from the Niger and Bioko, which was presented at a meeting of the Zoological Society of London (ZSL) on 10 June 1834. The collection included the new *Vanellus albiceps*, described by Gould (1834), which is included in Allen and Thomson's list (1848). The type specimen was presented to the ZSL and was acquired by BMNH in 1881, via the Eyton Collection.

In 1843, 15 birds acquired by BMNH (nos. 1843.3.31.1–15), were listed in the accessions register as "Presented by Mrs Heywood [possibly a relative of Thomson: J.A. Jobling, pers. comm.] Niger Expedition" and a further seven presented on the same day (nos. 1843.3.31.15–22) were listed as "Niger Exp. Presented by Mrs Heywood and Cpn. Allen". These 22 specimens are of 11 species and include two of the 39 type specimens listed in the Appendix: *Hirundo nigrita* (Gray 1845) and *Glareola cinerea*, described by Fraser (1843c). Both were collected at the entrance to the River Nun, one of the mouths of the Niger Delta. There is an account of their collection in Allen & Thomson (1848, vol. 1, pp. 166–167).

Louis Fraser (c. 1819–1883)

Fraser was Curator of the ZSL's collection when he was appointed naturalist to the Niger Expedition. Instructions for him were drafted by Sir William Jardine (RSM

Jardine unpubl. 6/137). Almost nothing is written about Fraser in any of the accounts of the expedition, although he is listed as on the *Wilberforce* with Allen (Allen & Thomson 1848, vol. 1, p. 467).

Fraser's own account of the expedition is given in a series of unpublished letters, written from June 1840 to June 1842, to the 13th Earl of Derby (LRO Derby unpubl., MAL Derby unpubl.). In June 1840, Fraser wrote to Derby asking him to propose to the Council of the Zoological Society that a naturalist be appointed to the Niger Expedition. Derby supported Fraser's appointment and furnished him with additional funds to make collections on his behalf. Fraser's letters in 1840 and early 1841 make brief references to the preparations for the expedition, and four letters written in West Africa (13 Aug 1841, 6 Feb, 17 Mar and 6 Jun 1842) describe his part in it, from the start to the arrival at the mouth of the Niger, the ascent of the river to the confluence, withdrawal to Bioko and Ascension, and his return to Bioko in May 1842. He became very ill during the ascent, and was carried on the *Wilberforce* to Ascension in October 1841. He was considered too unfit to continue with the expedition when it returned to the West African mainland in March 1842. He made his own way to Bioko, reaching it by 15 May 1842, after spending six weeks along the Gulf of Guinea in other naval vessels. He found lodgings on the island and, despite the onset of the wet season, began a collection of birds, mammals, fish and crustaceans. The months spent in the Gulf of Guinea from March to July were profitable; he collected over 100 skins as well as specimens in spirits (Fraser 1842a, 1/59/2–39 in LRO Derby unpubl.). He is likely to have returned to Britain in HMS *Kite* with the main party of the expedition in July 1842; his return to London by 25 Sep 1842 is noted in a letter from the expedition collector Thomas Whitfield to Derby (MAL Derby unpubl.).

Fraser's was the largest contribution to the list of birds in Allen & Thomson (1848). It included 35 of the species listed; of which 34 were thought to be new, 20 from Bioko, one from Sierra Leone, three from Liberia, six from Ghana, two from Nigeria, one from Annobón and one from São Tomé. Of the 34 new species described, 30 are recognised as valid species or subspecies in BoA. After his return to London, his zoological collections were presented at meetings of the ZSL. During the autumn of 1842, Fraser (1842b,c,d) described 11 new bird species: *Platysteira castanea* [*P. c. castanea*], *P. leucopygialis* [*P. c. castanea*], *Euplectes rufovelatus* [*Malimbus rubricollis rufovelatus*], *Sylvia* [*Eremomela*] *badiceps*, *Coccothraustes* [*Linurgus o.*] *oliva-ceus*, *Nigrita fusconotus* [*N. f. fusconota*], *Amadina* [*Lonchura p.*] *poensis* and *Strix poensis* [*Tyto alba affinis*] from Bioko; *Ploceus collaris* [*P. grandis*] from São Tomé; *Amadina* [*Lonchura poensis*] *bicolor* from Cape Palmas; and *Pitta pulih* [*P. angolensis*] from Sierra Leone. At meetings during 1843 he described a further 18 new birds (Fraser 1843a,b,c,d): *Sylvicola* [*Camaroptera*] *superciliaris*, *Bucco* [*Pogoniulus s.*] *subsulphureus*, *Muscipeta tricolor* [*Terpsiphone rufiventer tricolor*] and *Halcyon* [*Corythornis l.*] *leucogaster* and *D.* [*Apalis*] *rufogularis* from Bioko; *Collurio smithii* [*Lanius collaris smithii*], *Drymoica* [*Melocichla m.*] *mentalis*, *D. strangei* [*Cisticola natalensis strangei*], *D. uropygialis* [*C. juncidis uropygialis*],

Estrilda [*Lagonosticta* r.] *rufopicta* and *Ixos inornatus* [*Pycnonotus barbatus inornatus*] from Ghana; *D. lateralis* [*C. lateralis*] and *Anthus gouldii* [*A. leucophrys gouldii*] from Liberia; *Muscipeta smithii* [*Terpsiphone rufiventer smithii*] from Annobón; *Drymoica ruficapilla* [*Cisticola anonymus*] and *D. rufa* [*C. rufus*] from Nigeria; *Glareola cinerea* collected by Allen (see above) in Nigeria; and *Treron crassirostris* [*T. sanctithomae*], which had been collected by Thomson. Fraser (1843d) gave no type locality for *Treron crassirostris*, but later believed it to be from São Tomé (Fraser 1849).

At a meeting of the ZSL on 25 Jun 1844 Strickland (1844) described *Cypselus* [*Cypsiurius*] *parvus* and the seven new species *Prinia olivacea* [*Apalis* r. *rufogularis*], *P. icterica* [*Camaroptera superciliaris*], *Cossypha* [*Neocossyphus*] *poensis*, *Andropadus latirostris*, *A. gracilirostris*, *Muscicapa* [*Neocossyphus*] *fraseri* and *Tephrodornis ocreatus* [*Fraseria ocreata*], all from Fraser's collection from Bioko.

In 1847, BMNH purchased 64 bird skins from Fraser (nos. 1847.1.18.1–62, 1847.3.12.2–3), which included 25 types. Six more types were purchased with the sale of the Eyton Collection in 1881 (nos. 1881.2.18.5, 19, 31, 136, 153, 629) (Sharpe 1906). Three types described by Fraser were not acquired by BMNH: *Bucco* [*Pogoniulus* s.] *subsulphureus*, *Pitta pulih* [*P. angolensis pulih*] and *Strix poensis* [*Tyto alba affinis*], and their whereabouts are not known.

Fraser (1849) illustrated 21 new bird species from West Africa, including 20 of those listed in Allen & Thomson (1848); some additional field notes are given in the text. He refers to two specimens of *Vanellus albiceps* "procured" by Allen on Fernando Po and presented by him (Allen) to ZSL (Fraser 1849, pl. 64). It is not clear whether he was referring to the type of *V. albiceps* (collected 1832) or to other individuals collected in 1841 (see below). Fraser (1849) also included *Nigrita canicapilla* from Bioko, which had been described by Strickland (1841) from an 1833 specimen collected on the island. Fraser collected a specimen on Bioko in 1842 (acquired by BMNH, no. 1847.1.18.8), which was not listed by Allen & Thomson (1848).

William Stanger M.D., F.G.S. (1811–1854)

Stanger was appointed geologist and explorer to the expedition. He sailed with Trotter in the *Albert* and returned with him to Britain in November 1841, after ascending the Niger to Eggan. His small bird collection included two new sunbirds listed by Allen & Thomson (1848): *Nectarinia chloropygia* [*Cinnyris chloropygius*] and *N. stangerii* [*Chalcomitra rubescens stangerii*]. They were probably actually collected by Thomson and given to Stanger (Allen & Thomson 1848, vol. 2, p. 222). On Stanger's return to Britain in January 1842, he gave them to George Waterhouse of ZSL. Waterhouse showed the collection to Jardine in July 1842 (6/138 in RSM Jardine unpubl.) and Jardine (1842) described the four species in the collection: *Chrysococcyx auratus* [*C. cupreus*], from the description a male; and three sunbirds *N. chloropygia*, *N. stangerii* and *N. cyanocephala* [*Cyanomitra verticalis cyanocephala*]. *Chrysococcyx auratus* and *Nectarinia cyanocephala* were not included by Allen & Thomson (1848).

Jardine had a single male of *N. chloropygia*, which he compared with one evidently retained by Stanger (Jardine 1842). The holotype was included in the sale of Jardine's collection in 1886 (Anon. 1886), when it was purchased for BMNH (no. 1886.6.24.314). It is catalogued "River Niger Dr Strange" in the 1881 Quaritch Sale Catalogue of Jardine Bird Skins (Anon. 1881). The whereabouts of Stanger's other specimen are unknown.

Jardine refers to only one specimen of *N. stangerii*, in breeding dress, which he describes as "the Niger bird" leading to some confusion subsequently about the type locality. However, there is an account of the collection of *N. stangerii* from Bioko by Thomson, probably from Bassa Pu (Allen & Thomson 1848, vol. 2, p. 221, Moore 1995, Cheke 2001). The type seems to have been lost. There is no record in the accessions register of BMNH to suggest that other birds of Stanger's collection were acquired, although he presented other zoological specimens to the museum in 1842 and a visit he paid to the museum in October 1842 is recorded in the visitors' book. Enquiries elsewhere in Britain and South Africa, where Stanger lived from 1843, have so far been unsuccessful (Moore 1995).

Thomas R.H. Thomson, M.D., Surgeon R.N. (c. 1813–1876)

Thomson was Surgeon on the *Wilberforce*, with Allen, transferred to the *Soudan* as she ran down the Niger and left for Bioko on 26 September 1841. He stayed on the island for some weeks before joining the *Albert* when she left Bioko on 18 December 1841 for Ascension Island, giving an opportunity to collect on Príncipe (20 Dec) and São Tomé (24 Dec) where the ship anchored at the islet of Rollas, before going on to Annobón and Ascension, which was reached on 28 Jan 1842. He rejoined Allen on the *Wilberforce* and returned to the coast of West Africa from March to July 1842.

Thomson's collection of 19 birds now held at BMNH includes six species listed in the appendix of Allen & Thomson (1848). The six include the types of four species described as new: *Porphyrio alleni*, collected from the Niger by the town of Idda and *Tchitrea* [*Terpsiphone*] *atrochalybeia* from São Tomé (Thomson 1842); *Treron crassirostris* [*T. sanctithomae*] from São Tomé (Fraser 1843d); and *Cinnyris eboensis* [*Nectarinia adelberti eboensis*] collected from Aboh on the banks of the lower Niger (Jardine 1843). The other two were species of turaco, *Corythaeola c. cristata* from Bioko and *Tauraco macrorhynchus verreauxi* from the seldom-visited Mondoleh Island in Amba Bay, on the coast of Cameroon. Thomson presented 18 birds to BMNH between September and November 1842 (nos. 1842.9.24.1–8; 1842.10.13.1, 1842.11.4.1–9). He presented *Treron crassirostris* to ZSL in 1842; it was acquired by BMNH on the dispersal of the Society's collection in 1855 (no. 1855.12.19.304).

The birds of Allen & Thomson's (1848) natural history appendix

The following list of 46 bird species, presented in the order in which they appear, is taken from the natural history appendix of Allen & Thomson (1848). The entries on

the list, the name of the taxon, the authority and locality (“habitat”) and extracts from the notes accompanying them are given in quotes (“...”) as they appear in the original text of Allen & Thomson (1848). The modern scientific and English names given follow BoA. The BMNH registered number for specimens held in the collections at Tring is given; the type status for these birds follows Warren (1966) and Warren & Harrison (1971). Where I refer to only one syntype, this is the one placed by Warren & Harrison in the BMNH Type Collection. Unless otherwise mentioned, I did not locate the other syntypes in the general collection. Place names are given as in the Allen & Thomson (1848), with changes noted where necessary.

“*STRIX POENSIS* (Fraser, in Proc. Zool. Soc. Lond., Dec. 1842). Habitat: Fernando Po, West Africa. A very scarce bird.”

Tyto alba affinis Barn Owl. Holotype not held in BMNH, whereabouts unknown. From Fraser’s (1842a) description it seems that he had only one specimen, but there is a skin in BMNH Tring (*Tyto alba*, 1842.7.19.14, bearing a flimsy label with “Morgan” and “poensis” written on it), which was acquired from the Rev. D.F. Morgan in July 1842. Sharpe (1875) remarks that, unlike the other birds received from Morgan registered at the same time, which were from The Gambia, no locality is given for this specimen “a true *S. insularis*” and he suggests that it may have been collected in the Cape Verde Islands. Morgan was Colonial Chaplain of Sierra Leone for 10 years (Schön & Crowther 1842). In the course of his duties he would almost certainly have visited the British base then on Bioko, and probably the other islands of the Gulf of Guinea, so the possibility that the bird was collected on Bioko or São Tomé cannot be discounted. He did, in fact, meet members of the 1841 expedition on Sunday 28 June 1841 in Freetown (Schön & Crowther 1842).

“*TEPHRODORNIS OCREATUS* (Strickland, in Proc. Zool. Soc. Lond., June 1844). Habitat: Fernando Po, West Africa”

Fraseria ocreata Fraser’s Forest Flycatcher. Holotype: BMNH 1847.1.18.33, adult.

“*COLLURIO SMITHII* (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: Cape Coast Castle”

Lanius collaris smithii Fiscal Shrike. Holotype: BMNH 1847.1.18.30, adult male.

“*DRYMOICA MENTALIS* (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: Accra, West Africa”

Melocichla m. mentalis Moustached Grass-Warbler. Holotype: BMNH 1847.1.18.29, adult.

“*DRYMOICA LATERALIS* (Fraser, in Proc. Zool. Soc. Lond., 1843). Habitat: Accra, West Africa”

Cisticola lateralis Whistling Cisticola. Syntype: BMNH 1847.1.18.55, adult. “Accra” must be a typographical error. In Fraser (1843b) and subsequent literature, the type locality cited is Cape Palmas, Liberia. The skin is labelled “Cape Palmas July 1841”. Fraser (1843b) did not say how many specimens he collected. This skin was purchased from Fraser by the museum in 1847.

“*DRYMOICA STRANGEI* (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: Cape Palmas, West Africa”

Cisticola natalensis strangei Croaking Cisticola. Syntype: BMNH 1847.1.18.28, adult male. “Cape Palmas” is an error. Fraser (1843b) gives the habitat as Accra. It was purchased by the museum in 1847 from Fraser. Fraser (1843b) did not say how many he had collected.

“*DRYMOICA RUFICAPILLA* (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: River Nun, West Africa”

Cisticola anonymus Chattering Cisticola. Holotype: BMNH 1847.1.18.57, adult male. *Drymoica ruficapilla* was renamed *Cisticola anonyma* by Müller (1855); the name given by Fraser was already occupied by *Drymoica ruficapilla* A. Smith 1842, now *Cisticola fulvicapillus ruficapillus*.

“*DRYMOICA RUFA* (Fraser, in Proc. Zool. Soc. Lond., Feb., 1843). Habitat: River Niger opposite Iddah.”

Cisticola rufus Rufous Cisticola. Syntype: BMNH 1847.1.18.42, immature male, relaxed mount. Lynes (1930) calculated that the birds had been collected in August 1841 or July 1842. The expedition itinerary suggests a slightly later date in 1841: Iddah was not reached before 4 September that year. While the *Wilberforce*, with a limited crew that did not include Allen, Thomson or Fraser, reached Iddah on 10 July 1842 during the second brief ascent of the Niger, such was the difficulty of that ascent that it is unlikely any collecting would have been done (Allen & Thomson 1848, PRO unpubl., UKHO unpubl.). *D. rufa* was purchased by the museum in 1847 from Fraser. Fraser (1843b) does not say how many specimens he collected.

“*DRYMOICA RUFOGULARIS* (Fraser, in Proc. Zool. Soc. Lond., Feb, 1843). Habitat: Clarence, Fernando Po.”

Apalis rufogularis Buff-Throated Apalis. Holotype: BMNH 1847.1.18.52, adult. See *Prinia olivacea*.

“*DRYMOICA UROPYGIALIS* (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: Accra, West Africa”

Cisticola juncidis uropygialis Zitting Cisticola. Holotype: BMNH 1847.1.18.54, adult male.

“*MUSCICAPA FRASERI* (in Strickland, in Proc. Zool. Soc. Lond., June 1844). Habitat: Fernando Po, West Africa.

Neocossyphus fraseri Rufous Flycatcher-Thrush. Syntype: BMNH 1847.1.18.34, adult male. From his description, Strickland had a male and female before him. No. 1847.1.18.34 bears two labels, one marked “1159”, the other “*Muscicapa fraserii* Strickl”.

“*MUSCIPETA TRICOLOR* (Fraser, in Proc. Zool. Soc. Lond., Jan., 1843). Habitat: Clarence, Fernando Po”

Terpsiphone rufiventer tricolor Red-bellied Paradise Flycatcher. Holotype: BMNH 1847.1.18.56 adult female. Cited as *Muscipeta* (*Tchitrea*) *tricolor* Fraser (1843e) in subsequent literature. Urban *et al.* (1997) cite Neumann as authority for *T. rufiventer tricolor*, but this is almost certainly an error. Fraser’s (1843a) description suggests he had only one specimen “in deep moult”.

“MUSCIPETA SMITHII (Fraser, in Proc. Zool. Soc. Lond., Feb., 1843). Habitat: western Africa”

Terpsiphone rufiventer smithii Red-bellied Paradise Flycatcher. Holotype: BMNH 1881.5.1.629 adult male. Listed as the type by Sharpe (1881). This taxon is restricted to Annobón (Peters *et al.* 1986). Fraser (1843d) only specifies the type locality as “western Africa”; in view of what is known now of his itinerary he may not have visited Annobón and was therefore unable to be more precise. His acquisitions do include specimens that he had not collected live, *e.g.* *Pitta pulih* (Fraser 1842d), *Felis rutilus* (Allen & Thomson 1848) and *Pelicanus rufescens* (Fraser 1842c). The specimen was procured and described by Fraser in 1843 and was later acquired by BMNH at the sale of the Eyton Collection in 1881. However, it carries a label reading “Presented by T.R. Thompson [*sic*], Esq., R.N. 27 Sept. 1842”. The reverse side reads “Muscipeta smithii. Orig. of descr.” (M.P. Walters pers. comm.).

“ANTHUS GOULDII (Fraser, in Proc. Zool. Soc. Lond., Feb., 1843). Habitat: Cape Palmas, [Liberia] West Africa”

Anthus leucophrys gouldii Plain-Backed Pipit. Syntype: BMNH 1881.2.18.153, adult. Fraser (1843c) does not say how many he collected. This skin was purchased at the sale of the Eyton collection in 1881.

“SYLVICOLA SUPERCILIARIS (Fraser, in Proc. Zool. Soc. Lond., Jan.1843). Habitat: Clarence, Fernando Po”

Camaroptera superciliaris Yellow-Browed Camaroptera. Holotype: BMNH 1847.1.18.45, adult male. See *Camaroptera superciliaris*.

“TCHITREA ATROCHALYBEIA (Thomson, in Ann. Mag. Nat. Hist., Vol.X p.104 [error for p. 204] 1842). Habitat: Fernando Po”

Terpsiphone atrochalybeia São Tomé Paradise-Flycatcher. Holotype: BMNH 1842.9.24.3, adult male. The type locality is São Tomé (Peters *et al.* 1986). To his description of *T. atrochalybeia*, together with those of *Porphyrio alleni* and a new species of *Genetta*, Thomson (1842) added that it was his intention to deposit his collection in the British Museum. The specimen is listed in the accessions register of BMNH on 24 Sep 1842, in a collection of eight birds headed “Expedition of African Society Presented by TRW Thomson RN”, as “*Muscipeta atrochalybea* Th Fernando Po”. However, like most of the specimens in BMNH from the Niger Expedition, it lacks the original collector’s label and written on the present label is “F. Po Fraser”: see *M. smithii* above.

“PRINIA OLIVACEA (Strickland, in Proc. Zool. Soc. Lond., June 1844). Habitat: Fernando Po, Western Africa.”

Apalis r. rufogularis Buff-Throated Apalis. Holotype: BMNH 1847.1.18.53, relaxed mount. Synonymous with *Drymoica rufogularis*, of which Strickland’s description was “based on a young bird” (Sclater 1930).

“PRINIA ICTERICA (Strickland, in Proc. Zool. Soc. Lond., June 1844).”

Camaroptera superciliaris Yellow-Browed Camaroptera. Holotype: BMNH 1881.2.18.25, adult. Habitat not given in Allen & Thomson (1848), but Fernando Po

cited by Strickland (1844). Synonymous with *Sylvicola superciliaris*: see this species above.

“PITTA PULIH (Fraser in Proc. Zool. Soc. Lond., Dec., 1842). Habitat: Sierra Leone, West Africa.”

Pitta angolensis pulih African Pitta. Holotype not held in BMNH, whereabouts unknown. Originally procured by Thomson. Fraser (LRO unpubl.) complained that, during the expedition's only stay at Freetown, in June 1841, it had not been possible to travel inland. Fraser was “indebted” to Robert Clarke, Assistant Colonial Surgeon at Sierra Leone, for the single specimen, which Thomson had observed was “found only in the Timneh country” (Fraser 1842b).

“SYLVIA BADICEPS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). Habitat: Fernando Po, West Africa.”

Eremomela badiceps Rufous-Crowned Eremomela. Holotype: BMNH 1847.1.18.58, adult male.

“COSSYPHA POENSIS (Strickland in Proc. Zool. Soc. Lond., 1844). Habitat: Fernando Po, West Africa”

Neocossyphus poensis White-Tailed Ant-Chat. Holotype: BMNH 1847.1.18.35, adult male.

“IOXOS INORNATUS (Fraser in Proc. Zool. Soc. Lond., 1844). Habitat: Cape Coast, West Africa.”

Pycnonotus barbatus inornatus Common Bulbul. Holotype: BMNH 1881.2.18.19, adult.

“ANDROPADUS LATIROSTRIS (Strickland, in Proc. Zool. Soc. Lond., 1844). Habitat: Fernando Po, West Africa.”

Andropadus latirostris Yellow-Whiskered Greenbul. Syntype: BMNH 1881.2.18.136, adult female. The bird was purchased for the museum at the sale of the Eyton collection. Strickland mentions two other specimens collected by Fraser, “probably younger individuals”; these are BMNH 1847.1.18.16 and 17. Fraser (1849) figures a specimen, which he explains is not the female from his collection that was described by Strickland, which could not be found at that time. Fraser's figure was of an immature, without the yellow streak each side of the chin. Strickland (1844) had noted that the mandible of the young bird lacked serrations and had only a small sub-terminal notch. Benson (1999) suggests that only 1847.1.18.17 is an immature *A. l. latirostris*, and considers 1847.1.18.16 to be an *A. v. virens*.

“ANDROPADUS GRACILIROSTRIS (Strickland, in Proc. Zool. Soc. Lond., June, 1844). Habitat: Fernando Po, West Africa.”

Andropadus gracilirostris Slender-Billed Greenbul. Holotype: BMNH 1847.1.18.11, adult male.

“HIRUNDO NIGRITA (Thomson) [sic but actually described by Gray 1845]. Habitat: River Nun West Africa; met with as high up as Abòh”

Hirundo nigrata White-Throated Blue Swallow. Holotype: BMNH 1843.3.31.2, adult. An account of the first sighting of this swallow is given in the narrative “... new and

beautiful species of swallow ... was discovered performing its rapid evolutions over a placid pool of water ...", 15 Aug 1841 at the entrance to the river Nun (Allen & Thomson 1848, vol. 2, p. 166).

"CYPSELUS PARVUS (Strickland, in Proc. Zool. Soc. Lond.). **Habitat: Accra. From Mr Fraser's collection."**

Cypsiurus parvus Palm Swift. BMNH 1847.1.18.26.

"PLATYSTEIRA CASTANEA (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Fernando Po"**

Diaphorophya c. castanea Chestnut Wattle-Eye. Holotype: BMNH 1847.1.18.46, adult female. *P. leucopygialis* (below) is the male of this species (Sclater 1930).

"PLATYSTEIRA LEUCOPYGIALIS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Fernando Po, Western Africa"**

Diaphorophya c. castanea Chestnut Wattle-Eye. Holotype: BMNH 1847.1.18.48, adult male. Synonymous with *P. castanea* (above), which is the female.

"PLOCEUS COLLARIS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Island St. Thomas, West Africa"**

Ploceus grandis São Tomé Giant Weaver. Syntype: BMNH 1847.1.18.3, adult male. Fraser's name was preoccupied by *P. collaris* Vieillot. Gray (1849) renamed it *Hyphantornis grandis*.

"EUPLECTES RUFOVELATUS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Fernando Po, West Africa."**

Malimbus rubricollis rufovelatus Red-headed Malimbe. Syntype: BMNH 1847.1.18.50, adult male. Fraser collected several specimens; there are supposedly two other syntypes in the collection (Warren & Harrison 1971), of which I found only one (1847.1.18.51), which was acquired from Fraser at the same time.

"COCCOTHRAUSTES OLIVACEUS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Fernando Po, West Africa"**

Linurgus o. olivaceus Oriole-Finch. Holotype: BMNH 1847.3.12.2, adult female.

"AMADINA POENSIS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Fernando Po, West Africa"**

Lonchura p. poensis Black-and-white Mannikin. Syntype: BMNH 1881.2.18.31, adult (Warren & Harrison 1971). From Fraser's (1842c) description, he collected several specimens and the BMNH acquisitions included another three which may have been *L. p. poensis* (listed only as "*Amadina*"): 1847.1.18.43 and 44 from Fraser and 1843.3.31.20 from Allen. I could not find these in the BMNH collections of *L. p. poensis* or *L. p. bicolor*.

"AMADINA BICOLOR (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). **Habitat: Cape Palmas, West Africa"**

Lonchura poensis bicolor Black-and-white Mannikin. Syntype: BMNH 1847.1.18.22, adult male (Warren & Harrison 1971). Fraser (1842c) had three specimens. A second syntype (1847.1.18.23) is held in the general collections.

“NIGRITA FUSCONOTUS (Fraser, in Proc. Zool. Soc. Lond., Oct., 1842). Habitat: Fernando Po, West Africa”

Nigrita f. fusconota White-breasted Negrofinch. Holotype: BMNH 1847.1.18.19, adult.

“ESTRILDA RUFOPICTA (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843). Habitat: Cape Coast, West Africa”

Lagonosticta r. rufopicta Bar-breasted Firefinch. Holotype: BMNH 1847.1.18.24, adult male.

“NECT. STANG. (Jardine, in Nat.Lib., Vol.XXXVI, p 198). Habitat: Fernando Po”

Chalcomitra rubescens stangerii Green-throated Sunbird. Holotype not held in BMNH, whereabouts unknown (Moore 1995). Jardine described a single specimen, given to George Waterhouse of the ZSL by Stanger, on his return (Jardine 1842).

“CINNYRIS EBOENSIS (Thomson) NECTARINIA ADELBERTI (Jard. Nat. Lib., Vol. XXXVI, p 244). Habitat: Abòh [Eboe], River Quorra. A very scarce bird. Presented by Dr Thomson to the British Museum.”

Chalcomitra adelberti eboensis Buff-throated Sunbird. Holotype: BMNH 1842.9.24.8, adult male. Thomson describes collecting two specimens from Aboh in August 1841 (Allen & Thomson 1848, vol. 1, p. 250). The type was “... presented by RW [*sic*] Thomson from the Niger Expedition” (Warren & Harrison 1971). Jardine (1843, p. 244) included *Nectarinia Eboensis* Thomson but “Subsequently [p. 257], in the same volume he regarded this species as synonymous with *N. adelberti* Gervais ...” (Warren & Harrison 1971).

“NECTARINIA CHLOROPYGIA (Jardine, Nat. Hist. Nectarinidæ p 172). Habitat: Fernando Po.”

Cinnyris chloropygius Olive-bellied Sunbird. Holotype: BMNH 1886.6.24.314, adult male. The type locality is Nigeria. Jardine (1842) used a bird brought back by Stanger, collected on the Niger, for the type description. Stanger apparently had another, with which Jardine (1842, 1843) compared it, but this skin is not with the Stanger collection held at the Wisbech and Fenland Museum, Cambridgeshire. The holotype is listed in the catalogue of the sale of the Jardine collection in 1881, “River Niger Dr Strange”. It was purchased by BMNH in 1886 from the dealer Gerrard. Fraser collected eight males and three females from Clarence, Fernando Po (Jardine 1843).

“HALCYON LEUCOGASTER (Fraser, in Proc. Zool. Soc. Lond., Jan., 1843). Habitat: Clarence, Fernando Po.”

Corythornis l. leucogaster White-bellied Kingfisher. Syntype: BMNH 1847.1.18.25, adult male. Fraser (1843a), in his description of the male, does not say whether he collected other specimens. This male was bought by BMNH from Fraser in 1847. Thomson notes that he presented a *Halcyon leucogaster* to BMNH (Allen & Thomson 1848, vol. 2, p. 504), but the only kingfisher listed among the birds acquired by BMNH from Thomson is “Halcyon” BMNH 1842.11.4.6, which is *H. malimbica dryas* (Hartlaub 1854).

**“BUCCO SUBSULPHUREUS (Fraser, in Proc. Zool. Soc. Lond., Jan. 1843).
Habitat: Clarence, Fernando Po”**

Pogoniulus subsulphureus subsulphureus Yellow-throated Tinkerbird. Type not held in BMNH, whereabouts unknown. Fraser (1843a) collected three or four from the same tree, but the whereabouts of these syntypes are unknown. He adds a footnote that he collected several young specimens of *Bucco*, some of which he considered might be a different species, but did not have sufficient material to name it. From his description of these, they were probably *Bucco stellatus* (*Pogoniulus scolopaceus stellatus*) (Jardine 1851), collected by Fraser when he returned to W Africa as British Consul at Whydah, 1851–3. A UMZC specimen of *P. s. scolopaceus* (26/Cap/7/i/3), collected by Fraser and labelled “1843?? ??”, was probably collected on the Niger Expedition.

“ZIZORHIS GIGANTA Blue Plantain Eater (Thomson). Habitat: Fernando Po”

Corythaeola c. cristata Great Blue Turaco. BMNH 1842.11.4.2 is noted in the accessions register of 4 Nov 1842, among nos. 1–5 “Musophaga gigas Presented by Mr Thompson on payment of expenses 10/0/-” with “exchanged with Dr Rüppell” added; this may refer to nos. 1842.11.4. 1 and 4, which are not in the collection. Nos. 3 and 5 are *Tauraco macrorhynchus verreauxi* (see no. 42 below).

**“CORYTHAIX MACRORHYNCHA (Fraser, in Proc. Zool. Soc. Lond., 1837).
Habitat: Bimbia and Cameroons”**

Tauraco m. macrorhynchus Yellow-billed Turaco. The date 1837 is a typographical error for 1839. Three specimens (BMNH 1842.10.13.1, 1842.11.4.3 and 5) were collected from the same tree on Mondoleh Island, the largest island of Ambas Bay, Cameroon, each having a crest “... in a different state ... we have reason to believe they have been divided into distinct species, although it is quite clear to us, they were merely of different ages...” (Allen & Thomson 1848, vol. 2, p. 290). The accessions register of 13 Oct 1842 contains “Musophagus Mr R.W. Thomson, Esq. Some sp[?] plain green crest with white band under the red, with red tips to the crest feathers”.

**“TRERON CRASSIROSTRIS (Fraser, in Proc. Zool. Soc. Lond., Feb. 1843).
Habitat: Islands of St Thomas and Rollas ... where it abounds, together with many other varieties of pigeons ... Dr Thomson sent a specimen to the Zoological Society’s Museum, from which it was described by Mr Fraser ...”**

Treron sanctithomae São Tomé Green Pigeon. Holotype: BMNH 1855.12.19.304, adult, mounted specimen.

**“PORPHYRIO ALLENI (Thomson, in Ann. Mag. Nat. Hist. Vol.X 1842).
Habitat: Iddah, River Niger ... This very pretty species was shot among the reeds, on the inundated Island opposite Iddah, ... Dr Thomson called it Alleni, in honour of his distinguished commander, Captain W.Allen, R.N. Presented to the British Museum ...”**

Porphyrio alleni Allen’s Gallinule. Holotype: BMNH 1842.9.24.1 adult.

**“GLAREOLA CINEREA (Fraser, in Proc.Zool.Soc.Lond., Feb 1843). Habitat:
Banks of the mouth of the Nun River, West Africa”**

Glareola cinerea Grey Pratincole. Syntype: BMNH 1843.3.31.14, adult. Allen presented three specimens to BMNH; two syntypes (1843.3.31.13 and 14) are in the collections; the third, no. 15, was not found.

"VANELLUS ALBICEPS (Gould, in Proc. Zool. Soc. Lond., June 1834). Habitat: River Quorra, West Africa."

Vanellus albiceps White-headed Plover. Holotype: BMNH 1881.2.18.52. Presented by Allen to ZSL and figured in Fraser (1849). Collected by Allen on the Macgregor Laird Expedition to the Niger in 1832, probably from the sandbanks of the Niger during the dry season, although the exact location is not clear from Gould's description, and the holotype carries an Eyton label "Fernando Po". Fraser (1849) refers to two "procured" by Allen on Fernando Po and presented by him to ZSL; the whereabouts of these specimens are not known. If this refers to birds collected during the 1841 expedition they would not have been collected from Nigeria. The birds are absent from the Lower Niger when the river is in full flood (Moore 2000a).

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Short Notes — Notes Courtes

First records of Scarce Swift *Schoutedenapus myoptilus* and Grass Owl *Tyto capensis* from Mt Cameroon

When we found Scarce Swifts *Schoutedenapus myoptilus* for the first time on the West African mainland, on the edge of Manenguba Crater in 1999, we suggested that the species might also occur on Mt Cameroon and elsewhere, having apparently been confused at times with Bates's Swift *Apus batesi* (Dowsett & Dowsett-Lemaire 2000). Scarce Swifts are readily located from their distinctive calls: a good tape-recording is presented by Gibbon (1991), the same again by Chappuis (2000), and a sonogram was published by Dowsett & Dowsett-Lemaire (1978). We were able to visit the southern slopes of Mt Cameroon in March 2001, and found Scarce Swifts to be common there. We saw and heard them daily from 4–13 March (except for 5 March, after a storm). They were especially numerous in the area of Mann's Spring (4°7'N, 9°8'E) from 2000 to 2500 m, but we noted them down to 900 m at Mapanja (4°5'N, 9°10'E) and at Spider Camp (4°7'N, 9°9'E) at 1600 m, where one was tape-recorded. The Swifts were most conspicuous from dawn to mid-morning and from mid- or late afternoon to dusk, usually in pairs or small groups, calling when chasing each other (which they do frequently). Their absence at midday suggests they are not breeding at this time of year; moreover, no aerial matings were seen. Scarce Swifts should be expected to occur over some other montane forests of Cameroon, although they are apparently absent from Mt Kupe and the Bakossi Mts — we did not find any in 15 weeks of field work, at different seasons, over a period of four years. They have been known from nearby Bioko for nearly a century (Pérez del Val 1996); the paucity of records there may just reflect a lack of fieldwork by observers familiar with this Afromontane species. The Swifts could easily cross between Mt Cameroon and the island. They are known to be migratory (breeding visitors) in at least Malawi (Dowsett-Lemaire 1989) and Zimbabwe (Brooke *in* Harrison *et al.* 1997).

While camped at Mann's Spring we heard the call of a Grass Owl *Tyto capensis* on two separate evenings, each time just at the edge of the forest (at 2300 m), with extensive grassland on one side, and much bracken briar in the open montane forest that spreads below the grassland. The voice can be separated from that of Barn Owl *T. alba* by its being a single screech, quieter and never repeated in a series, with lower pitch, shorter duration and lack of tremolo. A recording is presented by Gibbon (1991) and the same again by Chappuis (2000). Mt Cameroon is the western limit of Grass Owl. It appears to be common in Manenguba Crater (Serle 1950, pers. obs.) and specimens are also known from Lake Paponoun (or Monoun) (Germain *et al.* 1973), some 100 km north-east of Manenguba. Moreover, Serle (1950) probably saw this owl at Bambulue, and there is a possible sight record from Mbi Crater (Dowsett-

Lemaire & Dowsett 1998). There are specimens of Barn Owl from Mt Cameroon (Reichenow 1911, under *Strix maculata*), but a sight record from grassland at 2500 m, attributed to Barn Owl by Eisentraut (1973), might perhaps have been a Grass Owl.

We thank James Acworth and E.M. O’Kah (Mt Cameroon Project) for arranging our fieldwork, and Dr Atanga Ekobo (WWF-Cameroon) for agreeing to our visit to Mt Cameroon while under contract to the Cross-Sanaga project. Dr C. Chappuis kindly reviewed this note.

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Comments on Black-throated Coucal *Centropus leucogaster*, claimed from Niger

Debout *et al.* (2000) report seeing near Niamey what would be the first Black-throated Coucal *Centropus leucogaster* for Niger. As they remarked, there are few records from this latitude, the nearest being from Kangaba in the Monts Mandingues of southern Mali (Lamarche 1980–1), and the nearest at any latitude being from Djodji and Kouniohou in Togo (Cheke & Walsh 1996), some 650 km south of Niamey. The habitat of the Niamey sighting (gardens and old cultivation) is quite atypical for this forest bird (LDCF pers. obs., Cheke *et al.* 1985). Even the extreme southwest of Niger seems to be utterly devoid of forest species such as the sedentary *C. leucogaster*. The only large coucal known from the Niamey area is the savanna Senegal Coucal *C. senegalensis*, although another that might occur is the Blue-naped Coucal *C. monachus*, whose status and distribution in W Africa are imperfectly known, owing to the few certain records of it. This species is reported from the R. Niger, some 620 km northwest of Niamey, at Diré in Mali (Lamarche 1980–1), and reappears further east at L. Chad (Dowsett 1971).

C. leucogaster is a skulking species that rarely leaves thick cover, but when seen should be the easiest coucal to identify; indeed, G. Debout (*in litt.*) stresses that “les conditions étaient très bonnes et l’oiseau très proche de nous ... et nous sommes donc certain que la poitrine était bien noire”. Debout *et al.* (2000) mentioned “le dessous vraiment blanc (non crème)” which would point to an adult of this species. *C. monachus* does not have any black on the throat as a rule, although Bannerman (1933) refers to the immature having “dark tips to some of the feathers of the throat”, but this would not be sufficient to give the appearance of a totally black throat, and in the juvenile the rest of the underparts would be buff rather than pure white. The rufous underparts of the morph *epomidis* of *C. senegalensis* also rule out that possibility, and in any case this form probably does not occur further inland than some 200 km from the coast (Elgood 1973). Perhaps an undescribed morph (black throat, white underparts) of *C. senegalensis* is involved.

We are not sure which species of coucal Debout *et al.* (2000) saw at Niamey, and G. Debout (*in litt.*) is now no longer certain of the identification. Despite the fact that the totally black breast recorded by Debout *et al.* (2000) seems not to allow for any known alternative other than *C. leucogaster*, we believe that there is insufficient evidence for this species to be claimed to occur in Niger.

We thank Gabriel Debout for kindly replying to our enquiries.

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Editor's note

As might be imagined, both referees and I strongly questioned this record before agreeing to publish it in *Malimbus*. At the time, the authors' description and additional correspondence seemed to allow for no alternative to *C. leucogaster*, despite the extremely unlikely habitat. The record was therefore published as it stood. The bird's description, taken in excellent viewing conditions, still argues for *C. leucogaster*, although the habitat does not, and vagrancy in this sedentary species seems unlikely. The suggestion of an undescribed form is intriguing. Other observers might care to examine the site of Debout *et al.*'s record, or skin collections.

Première observation d'une *Zoothera* en Guinée

Le 11 décembre 2000, marchant en compagnie de Michel Fouquet sur une piste à quelques km à l'est de Tountouroun, préfecture de Labé, Guinée (11°24'N, 12°14'W) à c. 1000 m d'altitude, mon attention a été attirée par un oiseau fouillant la litière de feuilles sèches du sous-bois proche. J'ai pu d'abord apercevoir l'oiseau effectuant un court vol au ras du sol, puis l'observer à l'aide de jumelles, pendant c. 10 s, posé au sol à c. 12 m de moi, avant qu'il ne s'éloigne à pied hors de ma vue. Cet oiseau avait l'apparence d'une grive et à peu près la taille d'une Grive musicienne *Turdus philomelos*. Il avait des barres sombres sous l'œil et en arrière de la joue, elle-même

claire, et ses couvertures alaires avaient des extrémités blanchâtres. Le dessus de la tête et du corps était uniformément brun, le poitrail était ponctué de taches noires, plus grandes et plus arrondies que celles de la Grive musicienne et ressemblant plutôt à celles de la Grive draine *T. viscivorus*, mais en faible densité, contrastant sur fond clair et ne s'étendant pas jusqu'au ventre. Cet oiseau était solitaire. Il n'a pas crié ni chanté pendant la demi-heure durant laquelle nous sommes restés dans les environs.

L'observation a eu lieu dans un secteur relativement peu dégradé du massif du Fouta-Djalou. La pente du sol y est de l'ordre de 30°. La couverture boisée est continue sur plusieurs centaines d'hectares. La taille des arbres, atteignant au maximum c. 30 m, varie selon la profondeur du sol. A l'endroit précis de l'observation, le sol est superficiel. Les arbres y sont donc de taille modeste et l'ouverture du milieu créée par la piste favorise également la pénétration de la lumière sur ses abords, ce qui explique la présence d'un sous-bois broussailleux assez dense. Sur le même site (dans un rayon de quelques dizaines de mètres) ont aussi été observés: Pigeon vert à front nu *Treron calva*, Barbion à croupion jaune *Pogoniulus bilineatus*, Pic cardinal *Dendropicos fuscescens*, Pic gris *D. goertae*, Gobemouche noir *Ficedula hypoleuca*, Cratérope à tête noire *Turdoides reinwardii*, Souïmanga à ventre jaune *Nectarinia venusta*, Souïmanga à poitrine rouge *N. senegalensis*, Pie-grièche cubla de Gambie *Dryoscopus gambensis*, Gonolek de Turati ou d'Abyssinie *Laniarius* sp., Drongo de Ludwig *Dicrurus ludwigii* et Astrild queue-de-vinaigre *Estrilda caerulescens*.

Les caractéristiques de l'oiseau désignent sans aucun doute une *Zoothera*, ce qui est conforté par son comportement et le milieu où il se trouvait. La détermination spécifique est plus problématique, puisqu'il présentait des caractères communs à un immature de Grive olivâtre *Z. princei* et à la Grive tachetée *Z. guttata* sans correspondre précisément à l'une ou l'autre de ces espèces telles qu'elles sont décrites par Urban *et al.* (1997), Clement (1999) et Clement & Hathway (2000).

Aucune espèce de *Zoothera* n'a jusqu'alors été signalée en Guinée. La seule *Zoothera* dont l'aire de répartition s'approche du site de cette observation est *Z. princei*, connue, à plus de 500 km de là, de l'extrême est de la Sierra Leone et de la partie libérienne du Mont Nimba (Urban *et al.* 1997, Clement & Hathway 2000). Les cinq sous-espèces de *Z. guttata* ont une répartition extrêmement localisée et morcelée, entre le sud du Soudan et l'Afrique du Sud.

L'avifaune du Fouta-Djalou est très mal connue. Quelques jours de prospection ornithologique nous ont permis d'y observer bon nombre d'espèces (y compris des espèces communes et/ou plus facilement visibles qu'une *Zoothera*) loin de leur aire de distribution connue. Pour ne prendre que l'exemple des autres observations, citées ci-dessus, le Pic cardinal et le Drongo de Ludwig sont les premiers observés en Moyenne-Guinée, le Pic gris, le Gobemouche noir, le Cratérope à tête noire, le Souïmanga à poitrine rouge et la Pie-grièche cubla de Gambie sont les premiers observés dans la préfecture de Labé. Le Barbion à croupion jaune est une espèce

omniprésente, dont nous avons fait les premières observations dans sept préfectures différentes couvrant la majeure partie du massif.

Elle doit tenir compte d'autre part de ce que, selon Clement (1999) les *Zoothera* africaines présentent "un défi aux taxonomistes et à l'observateur de terrain". Compte tenu de cela, aucune hypothèse ne peut être totalement exclue, y compris le fait qu'il s'agisse d'une nouvelle sous-espèce ou espèce de *Zoothera*.

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News & Letters — Nouvelles & Lettres

Request for bird observations from Ivory Coast

A project to compile an annotated species list for the birds of Ivory Coast has started recently. We should appreciate receiving any species lists and additional information such as numbers, seasonal appearance, habitat, breeding and moult of birds in the country.

Demande d'informations sur les oiseaux de Côte d'Ivoire

Une initiative pour l'édition d'un livre sur les oiseaux de Côte d'Ivoire est en cours. Nous serions heureux de recevoir toutes informations additionnelles sur les oiseaux du pays, telles que des données numériques, les observations saisonnières, habitats, nidifications et mues.

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Africa Section of the Society for Conservation Biology

Research and training institutions in Africa have existed for decades, but today conservation science in parts of Africa is faltering. There is a need to develop and build on existing capacity in order to promote better science in the management and preservation of Africa's spectacular wildlife heritage. An important step in this direction is the creation of an Africa Section of the Society for Conservation Biology. The section aims to be a pan-African conservation network to bring scientists and practitioners together in a virtual and real way through various activities identified by the group. The section will also strengthen an African voice within the SCB.

An Interim Committee of the Africa Section has been formed, prior to elections for office bearers in Mar–Apr 2002. Procedures for elections will be developed to

ensure that there is good regional representation. The Interim Committee includes Paula Kahumbu (Acting Chair), Trinto Mugangu (representing Central Africa), William Oduro and Egnankou Wadja (West Africa), Chris Chimimba and Joan Jaganyi (Southern Africa), and Nyawira Muthiga (marine ecosystems). Alan Rodgers and Paula will represent East Africa. Sanjayan Muttulingam and Alastair McNeilage represent non-African members.

We will launch the section officially at the SCB meeting at the University of Kent, England, in July 2002. We are also hoping to publicise conservation issues in Africa at that meeting and encourage Africans to present their research findings. A special symposium on African conservation issues entitled "Living with Wildlife in Africa" has been proposed which will focus on emerging conservation issues in Africa. We should particularly like to hear from any African ecologists interested in presenting their research at that meeting.

To join the Africa section you must be a member of the SCB (apply through www.conservationbiology.org) and then you can simply send a message to africa@conservationbiology.org stating your interest. You can join only one regional section as a voting member but you can be a non-voting member in other sections.

We soon plan to create an email-based African bulletin that will distribute information on the contents of the SCB journals *Conservation Biology* and *Conservation Biology in Practice*, as well as additional information relevant to Africa such as research and funding opportunities, meeting notices, etc. This will be available free to members and non-members in English and French, and anyone is encouraged to send information for posting.

We would appreciate hearing from anyone interested in assisting the section in a voluntary capacity (fund raising, web design, information exchange *etc.*). We would also like to hear from people interested in sponsoring African memberships.

We look forward to this exciting venture and to hearing from you.

Paula Kahumbu, Alan Bornbusch, Mac Hunter

Reviews — Revues

Threatened Birds of the World, senior editors A.J. Stattersfield & D.R. Capper, 2000. 852 pp., numerous maps and colour illustrations. Birdlife International, Cambridge. ISBN 0-946888-39-6, hardback, £70. Available from Lynx Edicions, Passeig de Gràcia 12, Barcelona, Spain (www.hbw.com).

This is a magnificent review of all bird species assessed by Birdlife according to the IUCN 1994 red data book criteria, including all species considered extinct since 1500. I found it hugely interesting and despite its size looked at every page, seeking species with which I was familiar. However, since this is the first rigorous global assessment of threatened birds, some inconsistencies inevitably occur.

Some 12% of the world's avifauna is considered Threatened (Critically Endangered CR, Endangered EN or Vulnerable VU), a figure much less than those for plants (where a flora has been fully assessed), mammals, reptiles, amphibians and fish. This difference may at least partly result from a non-rigorous application of certain of the IUCN criteria. This probably lies more with the category VU than others, and the 182 species listed as CR are probably a true representation of the world's most endangered bird species. However, the evaluation has been carried out at the (biological) species level, which results in many of the most endangered taxa being left out of the book completely.

Introductory sections discuss threats and trends, and show the global distribution of threatened species. The hotspots are all in the tropics, especially Indonesia, and the Upper Guinea to Cameroon region of W Africa ranks high. Most threatened species depend on forests. The major current threat appears to be habitat loss, but the major cause of recent extinctions has been introduced species. These introductory sections are exceptionally clearly written and presented, as one has come to expect of Birdlife publications. The species accounts are an excellent source of information on biology, populations, threats, and conservation action and needs. One quibble with the systematic section is that Family names are not included in the page headers.

The threat assessments themselves, for species with which I am familiar, seem mostly consistent in terms of matching the IUCN criteria, but not always, especially at lower levels (VU and Near-threatened NT). According to IUCN criteria, all single-small-island endemics match VU criterion D2 based on range and number of sub-populations, but not all receive this category. W African examples are Príncipe and São Tomé Speirops *Speirops leucophaeus* (NT) and *S. lugubris* (not included), whereas Fernando Po and Mt Cameroon Speirops *S. brunneus* and *S. melanocephalus*, and the single-island Golden White-eye *Cleptornis marchei*, all with similar ranges and ecology and no evidence of decline, receive VU. Some other species that are known or suspected to be suffering declines and have relatively small ranges, such as

some Upper Guinea or New Zealand species, are not included at all. In general it seems as though many species listed as NT should, according to the IUCN criteria, be listed as VU. Birdlife may have its own arguments for not strictly following the IUCN criteria, but if the latter are to be as far as possible comparable across taxonomic groups and different types of distribution, then the criteria should be followed to the letter by all evaluating authorities.

A short section near the end of the book lists some species as Least Concern (LC), although it is not clear how these were chosen. In theory, every non-threatened, non-NT species should be LC, unless it has not been evaluated (NE) or is listed as Data Deficient. In fact, it looks like many of the "LC" species should really be NT. The LC list as it stands suggests that all bird species not included in the book have not been evaluated, which is surely not the case. A simple species list of LC and/or NE species would have been better, instead of the brief descriptions for a few selected LC species.

Finally, a section at the end lists threatened and NT species by country, but disappointingly does not include the recently-extinct species. This would have been useful to show the progression of the process of extinction in different areas.

These criticisms do not in any way condemn the book. On the contrary, it is a timely and invaluable reference, and I hope that Birdlife will continue to find the money to permit regular revisions.

Alan Tye

The Birds of Angóla, by W.R.J. Dean, 2000. 433 + x pp., colour habitat photos, a few maps. Checklist 18, British Ornithologists' Union, Tring. ISBN 0-907446-22-1, hardback, £50.

The latest BOU checklist takes up an honourable tradition: the avifauna of an African country that has been effectively closed to study for many years. The second Checklist, of Zanzibar and Pemba (1979, BOU, London), was based mainly on Pakenham's studies that he had carried out much earlier, since few ornithologists had visited the islands since independence. This Angola checklist is based almost entirely on collections, and observational data by the author and colleagues, up to the 1970s. Angola has since experienced almost continuous civil war, and most of the country is now a minefield. Even the study of collections is incomplete: those within Angola, including those of A.A. da Rosa Pinto, could not be studied, and one large collection in Lisbon was lost when the Bocage Museum caught fire in 1978.

The book therefore summarises older knowledge and is most useful as a synthesis and evaluation of already-published data. It will form an excellent resource for further study after the landmines have been cleared.

There are some stylistic and content differences from previous BOU checklists. There is no statement of global range for the species; a pity since this is always useful to place the country's records within context, and a 1–2 line statement for each of the 900-odd species included would have increased the size of the book by less than five pages. Many of the species given in square brackets are included based on their occurrence in neighbouring countries and therefore probable occurrence in Angola, in addition to the more usual BOU convention of using square brackets to indicate doubtful records from within the country. Each species has all collection localities listed with month of collection (the fact that this could even be considered indicates how sparse were the data for the work). This is useful for rare species, but common species have up to a page of localities, which should really have been summarized, thereby both saving space and facilitating interpretation.

The photographs are excellent, and give a superb impression of the country's range of habitats, but I found myself wondering how many of the areas depicted still look like they did in the 70s: possibly many, given the low population density in Angola and the prevalence of landmines. However, Dean points out that most large mammals and birds are probably now verging on extinction due to hunting and mines. The gazetteer is also first-class, with hundreds of minor place-names and collection localities listed, which are not to be found in large atlases.

Many birds of the Guinea rainforests (including several *Malimbus* spp.) reach their southern limit in the Cabinda enclave or the Uige and Cuanza Norte provinces of Angola, many E African species are found in the savannas of the east of the country, and many southern African desert specialists extend up the coast into the arid Namibe and Benguela provinces. Although it has relatively few endemic birds for its size, Angola is a fascinating country biogeographically, with a large avifauna, and this book will surely stimulate much interest in field work within the country when the security situation finally permits.

Alan Tye

Instructions aux Auteurs

Malimbus publie des Articles, des Notes Courtes, des Revues de Livres, des Informations, des Nouvelles & Lettres et des illustrations traitant de l'ornithologie ouest-africaine. Les **Articles** et les **Notes Courtes** doivent être des apports originaux; ceux déjà publiés ailleurs, en partie ou en totalité, seront normalement refusés. Les Notes Courtes sont des articles de moins de 1500 mots (références comprises) ou de trois pages imprimées. Autant que possible, les manuscrits auront été auparavant soumis au moins à un ornithologue ou biologiste pour un examen minutieux. Les manuscrits seront envoyés pour critique à au moins un lecteur compétent. Les textes des **Nouvelles & Lettres** ne devraient dépasser 1000 mots.

Les **textes** sont acceptés en anglais et en français; la Rédaction pourra aider les auteurs dont la langue maternelle n'est pas l'une de celles-ci. Les textes soumis seront tapés en deux exemplaires, d'un seul côté de la page, avec double interligne et larges marges. Les auteurs ne doivent pas envoyer une disquette en même temps que l'article qu'ils soumettent, mais sont priés d'indiquer s'ils peuvent adresser une disquette ou une copie e-mail au cas où leur article serait accepté. Les disquettes seront retournées aux auteurs. Consultez l'Éditeur pour tout détail supplémentaire, p. ex. les logiciels compatibles.

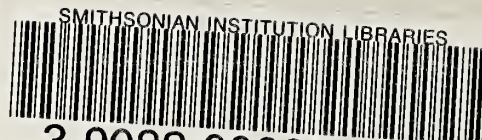
Les **conventions** concernant les tableaux, les chiffres, le système métrique, les références, *etc.* peuvent être trouvées dans ce numéro et doivent être soigneusement suivies. Notez en particulier que les dates s'abrègeront comme 2 fév 1990 mais dans un texte pourront s'écrire en entier; que les heures s'écriront comme 6h45, 17h00; que les coordonnées s'écriront comme 7°46'N, 16°4'W; que les nombres jusqu'à dix s'écriront en entier, excepté devant une unité de mesure (p. ex. 6 m), que les nombres à partir de 11 s'écriront en chiffres sauf au début d'une phrase. Toute **référence** citée dans l'article, et aucune autre, doit figurer dans la bibliographie.

Les articles d'avifaune doivent comprendre une carte ou une liste des localités citées. Ils devraient donner quelques détails sur le climat, la topographie, la végétation et l'environnement (y compris les événements inhabituels) avant ou durant l'étude (p. ex. pluies tardives, *etc.*). Les **listes d'espèces** ne devraient contenir que des données importantes: les listes complètes ne sont justifiées que pour les régions encore non étudiées ou délaissées pendant longtemps. Autrement, ne citer que les espèces sur lesquelles l'étude fournit de nouveaux faits sur la répartition, la période de séjour, la reproduction, *etc.* Pour chaque espèce, indiquer le statut migratoire, la période de séjour (telle qu'elle ressort de l'étude), l'extension de l'aire, une estimation d'abondance (*Malimbus* 17: 38) et les données datées sur la reproduction. Eventuellement, remplacez les faits dans le contexte en les comparant brièvement avec une liste régionale de référence. Les longues listes d'espèces devraient être sous forme de tableaux (p. ex. *Malimbus* 12: 39–51, 1: 22–28, ou 1: 49–54) ou sous forme de texte des derniers numéros (p. ex. *Malimbus* 12: 19–24, 12: 61–86, 13: 49–66, 16: 10–29). La **séquence taxonomique** et les **noms scientifiques** (et de préférence aussi les **noms vernaculaires**) devraient suivre Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) ou *The Birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, 2000, Keith *et al.* 1992, Academic Press, London), à moins de donner les raisons de s'écarter de ces auteurs. Un **guide plus complet aux auteurs** d'articles sur l'avifaune, comprenant une notation d'abondance des espèces la plus conseillée, est publié dans *Malimbus* 17: 35–39. On peut en obtenir une copie de la Rédaction, qui se fera aussi un plaisir d'offrir ses conseils sur la présentation de ce genre d'études.

Les **figures** doivent être préparées pour une reproduction directe, permettant une réduction de 20–50%; on se servira d'encre de chine sur papier blanc de bonne qualité ou calque épais et de caractères Letraset (ou équivalent) selon le cas. Les diagrammes obtenus par programmes informatisés autres que logiciels graphiques et sur imprimantes autres que laser sont rarement de qualité acceptable. Pour le dessin des Figures, tenir compte du format de *Malimbus*.

Tous les Articles (mais non les Notes Courtes) comporteront un **Résumé**, n'excédant pas 5% de la longueur totale. Le Résumé mentionnera brièvement les principaux résultats et conclusions de l'Article et ne sera pas un simple compte rendu du travail. Les résumés seront publiés à la fois en anglais et en français et seront traduits au mieux par la Rédaction.

Dix **tirés-à-part** des Articles (mais non des Notes courtes) seront envoyés gratis à l'auteur ou à l'auteur principal. Les tirés-à-part ne seront ni agrafés, ni reliés ou recouverts; ce sont de simples extraits de la revue.



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